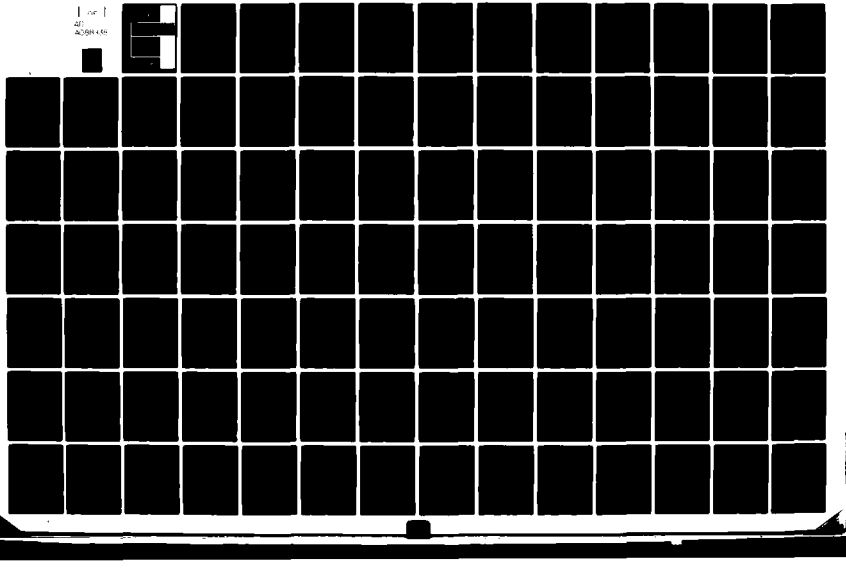
AD-A088 938 DAVID W TAYLOR NAVAL SHIP RESEARCH AND DEVELOPMENT CE--ETC F/G 2 /4
AFTERBODY DRAG, VOLUME 3, LITERATURE SURVEY,(U)
JUN 80 G S PICK, R M HARTLEY
UNCLASSIFIED DTNSRDC/ASED-80/13 NL



LEVEL III

AFTERBODY DRAG

VOLUME 3 – LITERATURE SURVEY

by

George S. Pick
Richard M. Hartley

AVIATION AND SURFACE EFFECTS DEPARTMENT

DTNSRDC/ASED-80/13

June 1980

DAVID W. TAYLOR NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

(14) 1. REPORT NUMBER: DTNSRDC/ASED-80/13 | 2. GOVT ACCESSION NO.: AD-A088938 | 3. RECIPIENT'S CATALOG NUMBER:

(6) 4. TITLE (and Subtitle): AFTERBODY DRAG, VOLUME 3, LITERATURE SURVEY, | (9) 5. TYPE OF REPORT & PERIOD COVERED: Final Report, | 6. PERFORMING ORG. REPORT NUMBER:

(10) 7. AUTHOR(s): George S. Pick, Richard M. Hartley | (16) 8. CONTRACT OR GRANT NUMBER(s): F32322, WR02302

9. PERFORMING ORGANIZATION NAME AND ADDRESS: David W. Taylor Naval Ship R&D Center, Aviation and Surface Effects Department, Bethesda, Maryland 20084 | 10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS: (See reverse side)

(11) 11. CONTROLLING OFFICE NAME AND ADDRESS: David W. Taylor Naval Ship R&D Center, Aviation and Surface Effects Department, Bethesda, Maryland 20084 | 12. REPORT DATE: June 1980 | 13. NUMBER OF PAGES: 94

14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office): Naval Air Systems Command, Washington, D.C. 20361; Naval Weapons Center, China Lake, California 93555 (12) (96) | 15. SECURITY CLASS. (of this report): UNCLASSIFIED | 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE:

16. DISTRIBUTION STATEMENT (of this Report)

APPROVED FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Base Pressure
Boattail Drag
Jet Interference
Subsonic Flow
Supersonic Flow
Transonic Flow

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The results of the afterbody drag study are presented in four volumes--Volume 1: Drag of Conical and Circular Arc Afterbodies; Volume 2: Jet Interference Effects on Subsonic Boattail Drag; Volume 3: Literature Survey; and Volume 4: Data and Analysis.

Volume 3 includes summaries of 119 reports, a bibliography of 608 reports, and a discussion of theoretical approaches to afterbody drag.

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S/N 0102-014-6601

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

387645

(Block 10)

Program Elements:
61153N
63361N
62332N

Task Area Numbers:
WR ~~032~~ 023 02 003
W15X20000
F32.322.203

Work Unit Numbers:
1660-234
1660-235

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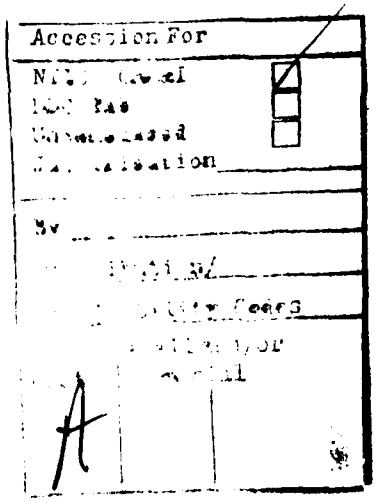

ABSTRACT

The results of the afterbody drag study are presented in four volumes -- Volume 1: Drag of Conical and Circular Arc Afterbodies; Volume 2: Jet Interface Effects on Subsonic Boattail Drag; Volume 3: Literature Survey and Volume 4: Data and Analysis.

Volume 3 includes summaries of 119 reports, a bibliography of 608 reports, and a discussion of theoretical approaches to afterbody drag.

ADMINISTRATIVE INFORMATION

The survey was conducted by the Aviation and Surface Effects Department of the David W. Taylor Naval Ship Research and Development Center with clerical assistance by Payne, Incorporated under ONR Contract N0014-75-C0926. The afterbody drag project was supported by the Naval Air Systems Command and the Naval Weapons Center under Program Elements 61153N, 63361N, and 62332N; Task Areas WR 023 02 003, W15X20000, and F32.322.203; and Work Units 1660-234 and 1660-235.

The references and bibliography are in the format of Payne, Incorporated.

INTRODUCTION

A literature survey was conducted as part of the afterbody drag evaluation project. The results of the survey are presented in four sections: (1) discussion of studies by various authors; (2) list of 119 reports considered applicable to the evaluation; (3) summary of the 119 reports in tabular form (~~Table 1~~); and (4) bibliography of open literature (608 reports and papers).

DISCUSSION

The literature survey disclosed that the vast majority of the open literature reports are very specialized or address a narrow subject matter. These reports are not suitable for establishing a basis from which the effects of the various geometrical, physical, and environmental parameters of afterbody drag can be systematically investigated. Only a small number of the reports are suitable for this purpose. These reports address conical afterbodies in the subsonic and transonic speed ranges.

Studies, evaluations, or research generally can be classified as experimental, empirical, or theoretical.

EXPERIMENTAL

In the subsonic and transonic speed ranges, only a small number of reports of the experimental type are suitable for establishing the foundation of an afterbody drag evaluation. References 1 through 5* are in this category and are based on the systematic testing of basic configurations over a wide range of geometrical parameters and Mach numbers.

EMPIRICAL

References 6 through 11 present various approaches to the problem of predicting boattail drag.

McDonald and Hughes[6] propose a method for the prediction of boattail drag and base drag of curved, conical, and cylindrical afterbodies and the effect of jet flow on the drag characteristics of the three types of afterbodies. The method, however, does not consider variation of the

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*A complete listing of references is given on page 5.

drag characteristics with Mach number, and its applicability is therefore limited. The method does introduce a direction of approach which can be applied to further investigations.

Bergman[7-8] proposes several approaches for the prediction of afterbody drag. One approach (Reference 7) presents qualitative and quantitative analysis of the effect of nozzle geometry and some physical parameters on the boattail drag. However, the effect of Mach number and base drag is not considered. A subsequent method (Reference 8) also does not consider base drag and is suggested only for Mach numbers less than 0.9.

The method of Swavely and Soileau[9] uses a parameter referred to as Integral Mean Slope, which is obtained by integrating an area ratio equation. The area ratios are obtained from the boattail and nozzle geometry. Due to the involved computations, the merits of the method were not investigated. The method has been modified by Brazier and Ball.[10]

The Presz-Pitkin method[11] predicts the flow separation point and pressure distribution on a boattail with a given solid surface sting in subsonic flow. After a determination of the separation point, an interactive method is used to match a calculated inviscid flow field, an attached boundary-layer, a control volume separation point, and the separated flow field model. This complex method is not included in this assessment.

THEORETICAL

The literature is a means for obtaining the theoretical relationships for correlative formulations. No significant, applicable theoretical

method with respect to subsonic and transonic flow was discovered which could be useful for the specific purpose of this investigation.

For supersonic flow, theory is of greater applicability because it is easier to treat mathematically. Consequently, a number of mathematical treatments of afterbody drag in supersonic flow are available. Although the supersonic case was not given extensive consideration, the work of Chapman,[12] with respect to base pressure, is fundamental. A correlation by Love[13] is based on the Chapman method for a variety of configurations and local Mach numbers. The base pressure is also useful in determining the boattail drag coefficient in the supersonic case. There is much material available to allow a systematic treatment of the supersonic case with respect to boattail and base drag (Brazzel and Henderson[14]).

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SYMBOL CODE AND DEFINITIONS FOR TABLE 1

Forebody Geometry

N_1	Ogive nose	B_2	Odd-shaped fuselage
N_2	Blunt nose	B_3	Body of revolution
N_3	Conical nose	W	Wing
N_4	Elliptical nose	I	Inlet
B_1	Cylindrical body		

Afterbody Geometry (Contour)

A_1	Conical	A_5	Other body of revolution
A_2	Circular arc	A_6	Ogival
A_3	Elliptical	A_7	Other
A_4	Cylindrical	A_8	Flared

$\frac{\ell}{d_m}$ *Fineness ratio*

β Maximum boattail angle

$\frac{P_{t_j}}{P_\infty}$ Jet pressure ratio

$\frac{d_j}{d_m}$ Jet diameter ratio

Jet Nozzle Geometry

N_1	Conical	N_5	Plug
N_2	Contoured	N_6	Blast tube
N_3	Converging	N_7	Cylindrical
N_4	Converging-diverging	N_8	Some

$\frac{\text{Fin Thickness}}{\text{Mean Length of Chord}}$ = Fin thickness ratio

Trailing Edge Position

Flush — Flush with base

Aft — Aft of base

Forward — Forward of base

$\frac{d_b}{d_m}$ — Base diameter ratio

$\frac{d_b^2 - d_j^2}{d_m^2}$ — Base area ratio

Boundary Layer Character (Afterbody)

L — Laminar

T — Turbulent

T_r — Transitional

L/T — Laminar/turbulent

R_d — Reynolds number based on d_{max}

R_ℓ — Reynolds number based on total body length

Mounting Technique

M_1 — Sting

M_2 — Strut

M_3 — Free flight

M_4 — Magnetic suspension

M_5 — Nose tube

M_6 — Wing support

M_7 — Splitter plate

Boattail Pressure Distribution

SPT — Static pressure taps

Output Format

TE Theoretical equations

EC Empirical correlations

G Graphs

T Tables

C Combination of above

Results, Limits

TC Test conditions

TABLE 1 - SUMMARY SHEETS OF EXPERIMENTAL INVESTIGATION REPORTS SURVEYED

			REPORTS SURVEYED				
			1	2	3	4	5
TEST CONDITIONS		MACH NUMBER RANGE	2.01, 3.27	.6 - 30	4.02	0.5 - 0.85	1.98
		REYNOLDS NO./FT x 10^{-6}	1.83-3.96	-	0.03	1.9 - 3.43	5.0
		α RANGE	0°	0 - 45°	0°	0°	0
CONFIGURATION	AFTERBODY	FOREBODY	N_3 B_1	N_1 B_1	B_1	N_4 B_3	N_3 B_1
	AFTERBODY	CONTOUR	A_1	A_4	A_4	A_2	A_4, A_3
	AFTERBODY	FINENESS RATIO	1.0, 2.0	3.0	-	-	0.25 - 2.0
	AFTERBODY	MAXIMUM DIAMETER	5 cm	3.75 in	.167 in	-	-
	AFTERBODY	MAX. BOATTAIL ANGLE	10°	-	0°	-	-25°
	JET	NUMBER	1	0.1	NONE	NONE	NONE
	JET	TEMPERATURE	-	-	-	-	-
	JET	PRESSURE RATIO	0-15, 40	-	-	-	-
	JET	DIAMETER RATIO	.60	-	-	-	-
	JET	NOZZLE GEOMETRY	N_2 N_3	-	-	-	N_7, N_5
	FINS	NUMBER	NONE	0, 4	NONE	NONE	NONE
	FINS	THICKNESS RATIO	-	-	-	-	-
	FINS	SWEEPBACK ANGLE	-	-	-	-	-
	FINS	TRAILING EDGE POS.	-	-	-	-	-
	BASE	DIAMETER RATIO	.647	-	1.0	0.32	1.0
	BASE	AREA RATIO	.64	-		0.1	-
BOUNDARY LAYER PARAMETERS		CHARACTER	T	-	L	T	T
		R_d x 10^{-6}	.3 - .65	-	-	-	-
		R_L x 10^{-6}	2.7-5.85	-	-	5 - 900	-
TYPE OF INVESTIGATION		THEORETICAL	NO	NO	YES	NO	YES
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	M_1 M_2	M_1	CANTILEVER	M_1	M_2
		BOATTAIL PRESS. DISTR.	SPT	-	-	-	SPT
		FORCE	-	-	-	YES	-
RESULTS		OUTPUT FORMAT	G,T	C	T, G,	G	TE, G, EC
	LIMITS	M	2.01-3.27	T C	4.02	0.3	1.98
	LIMITS	R_d	T C	T C	T C	T C	-
	LIMITS	α	0°	0° - 45°	0°	0°	0
	LIMITS	OTHER	-	-	-	-	-
PRINCIPAL APPLICATION		AIRCRAFT	✓	✓			✓
		MISSILES		✓	✓	✓	✓
		PROJECTILES		✓	✓	✓	✓
		NACELLES	✓	✓			✓

			REPORTS SURVEYED				
			6	7	8	9	10
TEST CONDITIONS		MACH NUMBER RANGE	0 - 6.0	2	1.58 - 2.99	1.2 - 3.0	1.62 - 2.41
		REYNOLDS NO./FT x 10^{-6}	-	5	3	1.9 - 4.41	1.5 - 15
		α RANGE	0 - 12°	0°	0	0	0°
CONFIGURATION	AFTERBODY	FOREBODY	-	B_1	N_1 B_1	B_1	N_1 B_3
		CONTOUR	A_1 A_5	A_1	A_4	A_1, A_4	A_5
		FINENESS RATIO	0.2 - 2.0	0.5, 1	2	0.82 - 1.24	8
		MAXIMUM DIAMETER	-	2 in	1.0"	-	1.0 in
		MAX. BOATTAIL ANGLE	16°	0,3°,6°,9°	0°	+15° to -15°	-
	JET	NUMBER	1	1	1	1	NONE
		TEMPERATURE	-	COLD(70°F)	COLD(70°F)		-
		PRESSURE RATIO	0 - 3.2	LOW	LOW	0 - 2.3	-
		DIAMETER RATIO	0.4 - 1.0	0.4	0.4	0.2 - 0.8	-
		NOZZLE GEOMETRY	N_4, N_8, N_3	N_4	N_7+ POROUS	-	-
	FINS	NUMBER	4	NONE	NONE	NONE	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	0°	-	-	-	-
		TRAILING EDGE POS.	ALL	-	-	-	-
	BASE	DIAMETER RATIO	0 - 1.0	1.0 - 0.685	1.0	-	0.336 - 1.0
		AREA RATIO	0.16 - 1.0	0.84 - 0.309	0.84	-	0.1 - 1.0
BOUNDARY LAYER PARAMETERS		CHARACTER	-	T	T	T	T
		R_d x 10^{-6}	-	0.83	0.25	-	0.125 - 1.25
		R_L x 10^{-6}	-	3.4 - 4.2	1.75	-	1.0 - 10.0
TYPE OF INVESTIGATION		THEORETICAL	YES	NO	NO	YES	NO
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	-	M_5	M_2	-	M_1
		BOATTAIL PRESS. DISTR.	-	S P T	-	SPT	S P T
		FORCE	-	YES	YES	-	YES
RESULTS		OUTPUT FORMAT	G	G, EC	G, EC		G
	LIMITS	M	T C	T C	T C	$\geq$ 1.0	T C
		R_d	T C	0.83 x 10^6	0.25 x 10^6		T C
		α	0 - 12°	0°	0°		0
		OTHER	-	2.5% BLEED	3.5% BLEED		-
PRINCIPAL APPLICATION		AIRCRAFT	✓	-	-		✓
		MISSILES	✓	-	✓	✓	✓
		PROJECTILES	✓	✓	✓		
		NACELLES	✓	-	-		✓

			REPORTS SURVEYED				
			11	12	13	14	15
TEST CONDITIONS		MACH NUMBER RANGE	4.3	0.5 - 15	0.9 - 1.2	0.6 - 0.9	0.6 - 0.975
		REYNOLDS NO/FT x 10^{-6}	0.90 - 2.56	-	-	1.35 - 4.12	-
		α RANGE	±0°	0°	0	13°	2.4° - 9.4°
CONFIGURATION	AFTERBODY	FOREBODY	N_3	N_3 (BLUNT)	N_1 B_3	B_2 W I	B_2 W
		CONTOUR	FLAT	-	A_4	A_6	A_5
		FINENESS RATIO	0.245	-	-	-	0.950
		MAXIMUM DIAMETER	0.737 in	-	2.5 in	-	25 in
		MAX. BOATTAIL ANGLE	-7°	-	0°	24°	-
	JET	NUMBER	NONE	NONE	1	2	1
		TEMPERATURE	-	-	COLD	HOT	-
		PRESSURE RATIO	-	-	.8	1.0	3.2 - 3.9
		DIAMETER RATIO	-	-	N_1	0.50	0.535
		NOZZLE GEOMETRY	-	-	NONE	N_3	N_7
	FINS	NUMBER	NONE	NONE	-	1	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-	-
		TRAILING EDGE POS.	-	-	-	FLUSH	-
	BASE	DIAMETER RATIO	1.0	1.0	1.0	0.50	0.535
		AREA RATIO	1.0	1.0	.335	≈0	0
BOUNDARY LAYER PARAMETERS		CHARACTER	T_T, L	T	T	T, SEPARATED	-
		R_d x 10^{-6}	0.055 - 0.157	-	-	-	-
		R_L x 10^{-6}	0.223 - 0.639	20 - 170	-	-	16-70
TYPE OF INVESTIGATION		THEORETICAL	NO	NO	NO	NO	NO
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	M_4	M_3	M_2	M_3	M_3
		BOATTAIL PRESS. DISTR.	WAKE SURVEY PITOT + HOT WIRE	STRAIN GAGE TRANSDUCER	S P T	S P T	S P T
		FORCE	NO	NO	NO	NO	NO
RESULTS		OUTPUT FORMAT	G	G	G	G	G
	LIMITS	M	T C	0.5 - 15	T C	T C	T C
		R_d	T C	T C	T C	T C	T C
		α	±0°	0°	-2 - +2	T C	T C
		OTHER	-	-	-	-	-
PRINCIPAL APPLICATION		AIRCRAFT			✓	✓	✓
		MISSILES	✓	✓	✓	✓	✓
		PROJECTILES	✓	✓			
		NACELLES				✓	✓

			REPORTS SURVEYED				
			16	17	18	19	20
TEST CONDITIONS		MACH NUMBER RANGE	0.6, 0.9	0.6 - 0.9	1.25 - 4.0	0.3 - 1.3	0.6 - 1.2
		REYNOLDS NO./FT x 10^{-6}	7.01 - 21.64	-	-	1.3 - 3.6	3.1 - 4.1
		α RANGE	4.6° - 9.1°	0 - 15°	0°	0°	0°
CONFIGURATION	AFTERBODY	FOREBODY	B_3	B_2 W I	N_1 N_3 B_1	N_3 B_1	N_1 B_3
		CONTOUR	A_1 A_2	A_6	A_2	N_1	A_1 A_2+A_1
		FINENESS RATIO	1.3	-	-	1.0 - 1.5	1.0 - 1.5
		MAXIMUM DIAMETER	63.5 cm	-	-	15.24 cm	6 in
		MAX. BOATTAIL ANGLE	24°	24°	12.4°	10°	10° - 20°
	JET	NUMBER	2	2	NONE	NONE	1
		TEMPERATURE	-	HOT	-	-	300-1013K
		PRESSURE RATIO	2.7 - 4.2	1.0	-	-	1.0 - 16.0
		DIAMETER RATIO	0.494	0.50	-	-	0.5
		NOZZLE GEOMETRY	N_7	N_3	-	-	N_2
	FINS	NUMBER	NONE	1	NONE	NONE	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-	-
		TRAILING EDGE POS.	-	FLUSH	-	-	-
	BASE	DIAMETER RATIO	0.494	0.50	0 - 1.0	0 - 1.0	0.51
		AREA RATIO	0.24	0	0 - 1.0	0 - 1.0	~0.01
BOUNDARY LAYER PARAMETERS		CHARACTER	T	T	L/T	T	T
		R_d x 10^{-6}	14.6 - 45.08	-	0.22 - 4	0.9 - 1.8	-
		R_L x 10^{-6}	91.1 - 281.1	3.5 - 65.0	0.2 - 20.0	8 - 16	-
TYPE OF INVESTIGATION		THEORETICAL	NO	NO	NO	NO	NO
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	M_2 M_3	M_1	M_3	M_2	M_2
		BOATTAIL PRESS DISTR.	-	S P T	NO	S P T	S P T
		FORCE	-	NO	NO	YES	NO
RESULTS		OUTPUT FORMAT	G	G	G	G	G
	LIMITS	M	1.0	T C	T C	T C	T C
		R_d	T C	T C	T C	T C	T C
		α	4.6° - 9.1°	T C	0°	0°	0°
		OTHER	-	-		-	-
PRINCIPAL APPLICATION		AIRCRAFT	✓	✓		✓	✓
		MISSILES		✓	✓	✓	✓
		PROJECTILES			✓	✓	
		NACELLES	✓	✓		✓	✓

			REPORTS SURVEYED				
			21	22	23	24	25
TEST CONDITIONS		MACH NUMBER RANGE	0.6 - 0.95, 1.2	0.3 - 1.3	1.83, 2.2	0.9 - 3.1	1.5 - 2.87
		REYNOLDS NO./FT x 10^{-6}	3.0 - 4.3	0.08 - 0.16	3.7 - 4.5	-	2.00
		α RANGE	0°	0°	0°	0°	0°
CONFIGURATION	AFTERBODY	FOREBODY	N_1 B_1	N_3	N_3 B_3	-	N_1 B_1
		CONTOUR	A_6	A_1 A_2	A_1 A_2	A_1 A_5	A_1
		FINENESS RATIO	1.0, 1.5	0.2 - 1.0	0.6 - 1.0	-	1.366
		MAXIMUM DIAMETER	6 in	15.24 cm	6 in	-	2.5 in
		MAX. BOATTAIL ANGLE	10°, 20°	20°	10.0°	17.2°	5.87°
	JET	NUMBER	1	1	1	1	1
		TEMPERATURE	80° - 1350°F	270° - 300°K	270° - 300°K	70° - 2500°F	COLD
		PRESSURE RATIO	1.0 - 11	1 - 13	2.94 - 32.6	1 - 35	8 - 300
		DIAMETER RATIO	0.5	0.3 - 1.0	-	0.4 - 0.9	0.45-0.80
		NOZZLE GEOMETRY	N_3 N_4	N_4	N_1	N_3 N_4	N_8 N_1 N_7
	FINS	NUMBER	NONE	NONE	NONE	NONE	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-	-
		TRAILING EDGE POS.	-	-	-	-	-
	BASE	DIAMETER RATIO	0.51	0.3 - 1.0	0.482 - 1.0	-	0.86
		AREA RATIO	0.0099	0.23 - 1.0	0.01	-	0.739
BOUNDARY LAYER PARAMETERS		CHARACTER	T	T	T	T	-
		R_d x 10^{-6}	1.5 - 2.2	1.2 - 2.7	1.55 - 2.07		0.4166
		R_L x 10^{-6}	15 - 24	8 - 16	-	5.5 - 35	4.83
TYPE OF INVESTIGATION		THEORETICAL	NO	NO	NO	NO	NO
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	M_2	M_2	M_2	M_2 M_1 M_7	M_2
		BOATTAIL PRESS. DISTR.	NO	S P T	S P T	S P T	S P T
		FORCE	YES	YES	NONE	NONE	NONE
RESULTS		OUTPUT FORMAT	G, EC	G	G	G	G
	LIMITS	M	0.6 - 1.2	T C	T C	T C	T C
		R_d	1.5 - 2.2	T C	T C	T C	T C
		α	0°	0°	0°	0°	0°
		OTHER	-	-	-	-	-
PRINCIPAL APPLICATION		AIRCRAFT	•		•		
		MISSILES	•	•	•	•	•
		PROJECTILES		•		•	
		NACELLES	•	•	•		

			REPORTS SURVEYED				
			26	27	28	29	30
TEST CONDITIONS		MACH NUMBER RANGE	0.6 - 1.28	0.6 - 1.4	0.8	0.4 - 1.25	3.0
		REYNOLDS NO/FT x 10^{-6}	3.4 - 4.8	5.1 - 6.6	3 - 25	1 - 3	-
		α RANGE	0°	0°	0°	-4° - 12°	0°
CONFIGURATION	AFTERBODY	FOREBODY	B_1	B_1	$N_1 B_1$	$N_1 B_3$	N_3
		CONTOUR	A_1	A_4	A_1	A_4	A_8
		FINENESS RATIO	0.22 - 1.43	0	0.6 - 1.2	-	-
		MAXIMUM DIAMETER	2 in	3 in	3 in	5 in	-
		MAX. BOATTAIL ANGLE	45°	0°	25°	0°	-12°
	JET	NUMBER	1	1	NONE	NONE	1
		TEMPERATURE	COLD, HOT	COLD	-	-	COLD
		PRESSURE RATIO	1 - 8	1 - 1.20	-	-	LOW
		DIAMETER RATIO	0.36 - 1.64	0.293	-	-	-
		NOZZLE GEOMETRY	N_8	N_4	-	-	BLEED
	FINS	NUMBER	NONE	4	NONE	4	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	45°	-	0°	-
		TRAILING EDGE POS.	-	FLUSH	-	FLUSH	-
	BASE	DIAMETER RATIO	0.55 - 0.89	1.0	0.415	1.0	1.0
		AREA RATIO	0.30 - 0.72	0.829	0.172	1.0	1.0
BOUNDARY LAYER PARAMETERS		CHARACTER	T	-	-	-	T
		R_d x 10^{-6}	0.57 - 0.80	0.425 - 0.55	0.75 - 6.25	-	0.11
		R_L x 10^{-6}	7.4 - 10.4	-	15 - 125	-	0.517
TYPE OF INVESTIGATION		THEORETICAL	-	NO	NO	NO	NO
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	M_5	M_5	M_1	M_1	M_5
		BOATTAIL PRESS DISTR.	S P T	S P T	S P T	S P T	PITOT STATIC TUBE
		FORCE	YES	NO	NO	NO	NO
RESULTS		OUTPUT FORMAT	G	G	G,T	T	G
	LIMITS	M	0.6 - 1.28	T C	0.8	0.4 - 1.25	T C
		R_d	T C	T C	T C	T C	T C
		α	0°	0°	0°	-4° - 12°	0°
		OTHER	-	-	-	-	-
PRINCIPAL APPLICATION		AIRCRAFT	✓		✓		
		MISSILES	✓	✓		✓	✓
		PROJECTILES	✓		✓	✓	✓
		NACELLES	-		✓		

			REPORTS SURVEYED				
			31	32	33	34	35
TEST CONDITIONS		MACH NUMBER RANGE	2.0	0.86 - 1.46	0.6 - 1.2	0.9 - 2.5	0.6 - 1.4
		REYNOLDS NO./FT x 10^{-6}	3.0	"		6.0	
		α RANGE	0°	0°	0°	-5° ~ +5°	0°
CONFIGURATION	AFTERBODY	FOREBODY	B_1	"	N_3 B_2 W I	N_1 B_3	N_1 B_1
		CONTOUR	A_4	"	A_2	A_4	A_1 A_4
		FINENESS RATIO	-	-		-	-
		MAXIMUM DIAMETER	1 in	-	-	4 in - 24.5 in	
		MAX. BOATTAIL ANGLE	0°	-	-	0°	10°
	JET	NUMBER	NONE	1	2	NONE	NONE
		TEMPERATURE	-	COLD - 600°C	950°F	-	-
		PRESSURE RATIO	-	1.68 - 2.08	1.0 - 10.0	-	-
		DIAMETER RATIO	-	-	-	-	-
		NOZZLE GEOMETRY	-	2 - D	N_3	-	-
	FINS	NUMBER	NONE	NONE	3	4	NONE
		THICKNESS RATIO	-	-	-	10%	-
		SWEEPBACK ANGLE	-	-	-	0°	-
		TRAILING EDGE POS.	-	-	FORWARD	FLUSH	-
	BASE	DIAMETER RATIO	1.0	-	-	1.0	-
		AREA RATIO	1.0	-	-	1.0	-
BOUNDARY LAYER PARAMETERS		CHARACTER	T	-	-	-	-
		R_d x 10^{-6}	0.25	-	-	-	-
		R_1 x 10^{-6}	3.0	-	-	0.5 - 100	-
TYPE OF INVESTIGATION		THEORETICAL	NO	NO	NO	NO	NO
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	M_5 (M_1)	WALLS	M_1	M_1 M_2 M_3	M_2
		BOATTAIL PRESS DISTR.	NO	PITOT TUBE	SURVEY RAKE	BASE PR.	S P T
		FORCE	" (B.Pr.)	NO	YES	NO	-
RESULTS		OUTPUT FORMAT	G, EC	G	G	G	G
	LIMITS	M	2.0	T C	T C	T C	0.6 - 1.4
		R_d	0.25×10^6	T C	T C	T C	T C
		α	0°	0°	0°	5°	0°
		OTHER	STING INT.	-	-	-	-
PRINCIPAL APPLICATION		AIRCRAFT	-	"	"		
		MISSILES	"	"	"	"	"
		PROJECTILES	"	"		"	"
		NACELLES		"	"		

			REPORTS SURVEYED				
			36	37	38	39	40
TEST CONDITIONS		MACH NUMBER RANGE	1.0 - 2.2	0.01	LOW SUBSONIC	0.9 - 2.0	1.1 - 1.9
		REYNOLDS NO/FT x 10^{-6}	3.8 - 5.0	0.334	1.4	4.6 - 3.8	-
		α RANGE	0°	0°	-2° - +6°	0°	0°
CONFIGURATION	AFTERBODY	FOREBODY	N_1 B_1	N_1 B_1	N_1 B_2 W	B_1	N_3 B_1
		CONTOUR	A_1 A_6	A_4 TRIP WIRE SLITS	A_6 A_7	A_4	-
		FINENESS RATIO	-	0	2.38 - 4.0	-	-
		MAXIMUM DIAMETER	-	[illegible] in	7.66 in	-	-
		MAX BOATTAIL ANGLE	[illegible]°	0°	26°	0°	-
	JET	NUMBER	1	[illegible]	NONE	1	NONE
		TEMPERATURE	[illegible]	-	-	70°F	-
		PRESSURE RATIO	[illegible]	-	-	1 - 101	-
		DIAMETER RATIO		-	-	0.11 - 0.33	-
		NOZZLE GEOMETRY	[illegible]	-	-	N_4 N_8	-
	FINS	NUMBER	[illegible]	[illegible]	[illegible]	NONE	NONE
		THICKNESS RATIO		-	-	-	-
		SWEEPBACK ANGLE	-		-	-	-
		TRAILING EDGE POS	[illegible]	-	-	-	-
	BASE	DIAMETER RATIO	[illegible]	[illegible]	0	1.0	1.0
		AREA RATIO		[illegible]	0	0.99 - 0.89	1.0
BOUNDARY LAYER PARAMETERS		CHARACTER	-	[illegible]	2	T	T
		R_δ x 10^{-6}	-	[illegible]	1.1	-	-
		R_L x 10^{-6}		[illegible]	9.5	-	4.8 - 9.2
TYPE OF INVESTIGATION		THEORETICAL	NO	NO	YES	NO	NO
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	M_1	M_4	M_6	M_5	M_1
		BOATTAIL PRESS DISTR	S P T	PROBE	S P T	NO	NO
		FORCE	NO	NO	YES	YES	NO
RESULTS		OUTPUT FORMAT	G	G	G, TE	G	G
	LIMITS	M	T C	LOW	T C	0.9 - 2.0	1.2 - 2.5
		R_d	T C	LOW	T C	-	T C
		α	0	0	T C	0	0
		OTHER	-	-	-	BASE PR.	
PRINCIPAL APPLICATION		AIRCRAFT	•		•		•
		MISSILES	•	•	•	•	•
		PROJECTILES	•	•		•	•
		NACELLES	•		•		

			REPORTS SURVEYED				
			41	42	43	44	45
TEST CONDITIONS		MACH NUMBER RANGE	1.57 - 3.2	0.8 - 2.5	0.55 - 2.2	0.5 - 8.0	0.9 - 3.3
		REYNOLDS NO./FT x 10^{-6}	-	40 - 1000	2.0 - 5.7	0.01 - 14	1.2 - 18.3
		α RANGE	-3° - +10°	-6° - +5°	-1° - +10°	0 - 10°	0°
CONFIGURATION	AFTERBODY	FOREBODY	N_3 B_1	N_1 B_1 N_1 B_1	B_2 W	N_1 N_3 B_1	N_1 B_3
		CONTOUR	A_4	A_4	A_4 A_5	A_4	A_6
		FINENESS RATIO	0	0	5.1	-	-
		MAXIMUM DIAMETER	3.00 cm	4 in	3.45 in	-	12 in
		MAX. BOAYTAIL ANGLE	0°	0°	-	0°	-
	JET	NUMBER	NONE	NONE	2	NONE	1
		TEMPERATURE	-	-	-	-	HOT
		PRESSURE RATIO	-	-	1 - 11	-	-
		DIAMETER RATIO	-	-	-	-	0.520
		NOZZLE GEOMETRY	-	-	N_3 N_4	-	N_4 N_6
	FINS	NUMBER	0, 4	4	4	4	4
		THICKNESS RATIO	0.10	0.1	-	0.05 - 0.10	0.05
		SWEEPBACK ANGLE	0°, 30°, 60°	0°	-	0°	60°
		TRAILING EDGE POS.	ALL	FLUSH	-	ALL	FLUSH
	BASE	DIAMETER RATIO	1.0	1.0	-	1.0	0.606
		AREA RATIO	1.0	1.0	-	1.0	0.0959
BOUNDARY LAYER PARAMETERS		CHARACTER	T	-	-	L, T	T
		R_d x 10^{-6}		0.55	-	-	1.2 - 17.5
		R_L x 10^{-6}		2 - 4	-	-	14 - 210
TYPE OF INVESTIGATION		THEORETICAL	YES	NO	NO	NO	NO
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	M_1	M_1 M_2	M_1 M_2	M_1	M_3
		BOATTAIL PRESS. DISTR.	S.F.P.	S.F.P.		NO	PRESSURE TRANSDUCER
		FORCE	NO	NO		BALANCE	NO
RESULTS		OUTPUT FORMAT	G	G	G	G	G
	LIMITS	M	T.C.	T.C.	T.C.	T.C.	T.C.
		R_d	T.C.	T.C.	T.C.	T.C.	T.C.
		α		T.C.	-1° - 10°	0° - 10°	0°
		OTHER	-	-	-	-	-
PRINCIPAL APPLICATION		AIRCRAFT			•	•	•
		MISSILES	•	•		•	•
		PROJECTILES				•	
		NACELLES			•		•

			REPORTS SURVEYED				
			46	47	48	49	50
TEST CONDITIONS		MACH NUMBER RANGE	1.7	0.8 - 1.4	0.4 - 1.19	0.2 - 1.1	0.8 - 1.3
		REYNOLDS NO./FT x 10^{-6}	1.2	5.3 - 8.5	3	-	2.69
		α RANGE	0°	0°	0°	0°	0°
CONFIGURATION	AFTERBODY	FOREBODY	N_1 B_1	N_1 B_3	N_1 B_3 W	B_1	B_1
		CONTOUR	A_1 A_6	A_5	A_7	A_4	A_2 A_6
		FINENESS RATIO	0 - 4.5	1.6 - 9.8	-	0	0.5 - 3.33
		MAXIMUM DIAMETER	0.75 in	7.5 in	-	0.75 in	1.5 in
		MAX. BOATTAIL ANGLE	12°		-	0°	17.1°
	JET	NUMBER	NONE	1	4	NONE	NONE
		TEMPERATURE	-	HOT	1800°F	-	-
		PRESSURE RATIO	-	-	HIGH	-	-
		DIAMETER RATIO	-	0.437	-	-	-
		NOZZLE GEOMETRY	-	N_4 N_6	N_4	-	-
	FINS	NUMBER	NONE	3	3	NONE	NONE
		THICKNESS RATIO	-	0.0278	-	-	-
		SWEEPBACK ANGLE	-	45°	-	-	-
		TRAILING EDGE POS.	-	FORWARD	FLUSH	-	-
	BASE	DIAMETER RATIO	0.708	0.437	-	1.0	0 - 0.94
		AREA RATIO	0.501	0	-	1.0	0 - 0.88
BOUNDARY LAYER PARAMETERS		CHARACTER	-	T	-	T	T
		R_d x 10^{-6}	0.77	3.31 - 5.31		-	0.34
		R_L x 10^{-6}	5.36	20 - 130	33.7 - 67.1	-	1.1
TYPE OF INVESTIGATION		THEORETICAL	YES	NO	NO	YES	NO
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	M_3	M_3	M_5	M_5 M_2	M_1 M_5
		BOATTAIL PRESS. DISTR.	THEORY	S P T	S P T	S P T	S P T
		FORCE	NO	NO	NO	NO	YES
RESULTS		OUTPUT FORMAT	G, TE, EC	G	G	G, TE	G
	LIMITS	M	T C	T C	T C	T C	T C
		R_d	T C	T C	T C	T C	T C
		α	0	0	T C	0	0
		OTHER	-	-	-	-	-
PRINCIPAL APPLICATION		AIRCRAFT		'	'	'	
		MISSILES		'	'	'	'
		PROJECTILES	'			'	'
		NACELLES		'	'	'	

			REPORTS SURVEYED				
			51	52	53	54	55
TEST CONDITIONS		MACH NUMBER RANGE	1.50 - 5.0	0.6 - 1.4	1.92	1.0 - 6.9	1.62 - 2.41
		REYNOLDS NO./FT x 10^{-6}	2.13 - 9.7	4.8	33	3 - 15	1.2 - 12
		α RANGE	0°	0°	·5°	0° - 9°	0°
CONFIGURATION	AFTERBODY	FOREBODY	N_3 B_1	N_1 B_1	N_1 B_3	N_1 B_1	N_1 N_2 N_3
	AFTERBODY	CONTOUR	A_1 A_2	A_4	A_6	A_1 A_4	A_1 A_4
	AFTERBODY	FINENESS RATIO	0 - 1.0	-	-	2.0 - 5.0	0
	AFTERBODY	MAXIMUM DIAMETER	5 cm	2.5 in	0.9 in	—	0.9 in
	AFTERBODY	MAX. BOATTAIL ANGLE	15°	-	-	15°	40°
	JET	NUMBER	NONE	NONE	1	NONE	NONE
	JET	TEMPERATURE	-	-	COLD	-	-
	JET	PRESSURE RATIO	-	-	1 - 3.6	-	-
	JET	DIAMETER RATIO	-	-	0.677	-	-
	JET	NOZZLE GEOMETRY	-	-	N_4	-	-
	FINS	NUMBER	NONE	NONE	NONE	0 and 4	4
	FINS	THICKNESS RATIO	-	-	-	0.1	0.08
	FINS	SWEEPBACK ANGLE	-	-	-	0°	45°
	FINS	TRAILING EDGE POS.	-	-	-	FLUSH	FORWARD
	BASE	DIAMETER RATIO	0.18 - 1.0	0.575, 1.0	0.677	0 - 1.0	0 - 1.0
	BASE	AREA RATIO	0.232 - 1.0	0.33, 1.0	0.459	0 - 1.0	0 - 1.0
BOUNDARY LAYER PARAMETERS		CHARACTER	L/T	L/T	-	T	L/T
		R_d x 10^{-6}	0.70 - 1.6	0.46	2.5	-	0.09 - 3.
		R_L x 10^{-6}	3.5 - 16	8.0	21	3 - 12	1 - 10
TYPE OF INVESTIGATION		THEORETICAL	YES	NO	YES	YES	NO
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	M_1	M_1	M_1	M_1	FINS
		BOATTAIL PRESS. DISTR.	?	S P T	S P T	YES	S P T
		FORCE	NO	YES	YES	NO	NO
RESULTS		OUTPUT FORMAT	G, TE	G	G, TE	G, EC	G
	LIMITS	M	T C	0.6 - 1.4	T C	T C	T C
	LIMITS	R_d	T C	T C	T C	T C	T C
	LIMITS	α	0°	0°	T C	T C	0°
	LIMITS	OTHER	-	-	-	-	-
PRINCIPAL APPLICATION		AIRCRAFT			'	'	
		MISSILES	'	'	'	'	'
		PROJECTILES	'	'		'	
		NACELLES			'	'	

			REPORTS SURVEYED				
			56	57	58	59	60
TEST CONDITIONS		MACH NUMBER RANGE	0 - 2	0.9	0.14 - 0.30	3.88	0.8
		REYNOLDS NO./FT x 10^{-6}	0.57 - 3.12	"	"	1.56	4.1
		α RANGE	0	0		0	0
CONFIGURATION	AFTERBODY	FOREBODY	N_2	N_1	B_1	B_1	
		CONTOUR	-	A_1 A_2 A_6	A_2	BASE MOUNTED CYLINDERS	A_6
		FINENESS RATIO	-	VAR.	-	-	0.30 - 0.35
		MAXIMUM DIAMETER	-		2.45 in	76.2 mm	5 in
		MAX. BOATTAIL ANGLE	-	24°	-	0°	-
	JET	NUMBER	NONE	1	NONE	NONE	1, 2
		TEMPERATURE	-	COLD - 1200°F	-	-	COLD
		PRESSURE RATIO	-	1 - 6.5	-	-	3
		DIAMETER RATIO	-	-	-	-	0.32 - 0.49
		NOZZLE GEOMETRY	-	-	-	-	N_3
	FINS	NUMBER	NONE	NONE	NONE	NONE	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-	-
		TRAILING EDGE POS.	-	-	-	-	-
	BASE	DIAMETER RATIO	1.558	0.25 - 0.85	0.816	-	0.32 - 0.49
		AREA RATIO	2.43		0.667	-	0 - 0.176
BOUNDARY LAYER PARAMETERS		CHARACTER	T	T	-	T	-
		R_d x 10^{-6}	0.06 - 0.32		-	0.389	1.7
		R_L x 10^{-6}	0.27 - 1.48		1.0	-	-
TYPE OF INVESTIGATION		THEORETICAL	NO	NO	NO	NO	NO
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	M_1	M_1	M_1	M_5	M_1
		BOATTAIL PRESS. DISTR.	NO	NO	S P T	S P T	S P T
		FORCE	NO	YES	NO	NO	YES
RESULTS		OUTPUT FORMAT	G, T	G, EC	G	G	G
	LIMITS	M	0 - 2	0.6 - 0.9	0 - 1.0	T C	T C
		R_d	T C	ANY	T C	T C	T C
		α	0	0		0	0
		OTHER		-	-	-	-
PRINCIPAL APPLICATION		AIRCRAFT		✓	✓		✓
		MISSILES	✓	✓		✓	
		PROJECTILES	✓			✓	
		NACELLES		✓	✓		✓

			REPORTS SURVEYED				
			61	62	63	64	65
TEST CONDITIONS		MACH NUMBER RANGE	-	1	0 - 5	SUBS/SUPS.	1.5 - 3.25
		REYNOLDS NO/FT x 10^{-6}	-	-	-	-	-
		α RANGE	0	0	0	-	0
CONFIGURATION	AFTERBODY	FOREBODY	N_1 N_3 B_1	-	B_1	-	N_2 B_1
		CONTOUR	A_1 A_6	-	?	-	A_4
		FINENESS RATIO	-	-	-	-	0
		MAXIMUM DIAMETER	-	-	-	-	-
		MAX. BOATTAIL ANGLE	-	3.2°	9.5°	-	0°
	JET	NUMBER	NONE	1	1	-	NONE
		TEMPERATURE	-	-	-	-	-
		PRESSURE RATIO	-	1 - 140	1 - 144	-	-
		DIAMETER RATIO	-	0 - 1.0	-	-	-
		NOZZLE GEOMETRY	-	-	-	-	-
	FINS	NUMBER	NONE	NONE	NONE	-	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-	-
		TRAILING EDGE POS.	-	-	-	-	-
	BASE	DIAMETER RATIO	-	0 - 1.0	-	-	1.0
		AREA RATIO	-	-	-	-	-
BOUNDARY LAYER PARAMETERS		CHARACTER	-	T	-	L/T	T
		R_d x 10^{-6}	-	-	-	-	1.5
		R_L x 10^{-6}	-	-	-	-	-
TYPE OF INVESTIGATION		THEORETICAL	YES	YES	YES	YES	YES
		EXPERIMENTAL	NO	YES	NO	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	-	-	-	M_1 M_2 M_3	M_1
		BOATTAIL PRESS. DISTR.	-	-	-	YES	TOTAL PRES.
		FORCE	-	-	-	YES	NO
RESULTS		OUTPUT FORMAT	G, TE	G	EC, G	C	G, TE
	LIMITS	M	1.0	1	T C	T C	T C
		R_d	-	-	T C	T C	T C
		α	0°	0°	0°	0° - 8°	0°
		OTHER	-	-		-	-
PRINCIPAL APPLICATION		AIRCRAFT	'	'	'	'	
		MISSILES	'	'	'	'	
		PROJECTILES	'		'	'	'
		NACELLES	'	'			

			REPORTS SURVEYED				
			66	67	68	69	7[illegible]
TEST CONDITIONS		MACH NUMBER RANGE	1.5 - 3.5	2.4 - 2.47	1.8 - 2.5	0.98 - 2.4	0.6 - 4.
		REYNOLDS NO/FT x 10^{-6}	–	2.3 - 4.4	2.69 - 4.6	–	[illegible] - 4.3
		α RANGE	[illegible]°	[illegible]°	[illegible]°	0°	[illegible]° - 12°
CONFIGURATION	AFTERBODY	FOREBODY	N_4 B_1	B_1	N_1 B_1	–	N_1 B_1
		CONTOUR	A_2	A_1	A_1 A_2 A_4	A_3	A_1 A_2
		FINENESS RATIO	3	2, 2, 3, 4	3 - 3.25	–	3
		MAXIMUM DIAMETER	1	1.46 in	4.[illegible] in	1	2.25 - 4.25
		MAX BOATTAIL ANGLE	2	19° - 21°	24°	–	7°
	JET	NUMBER	NONE	NONE	1	NONE	NONE
		TEMPERATURE	–	–	1200°F	–	–
		PRESSURE RATIO	–	–	3 - 4	–	–
		DIAMETER RATIO	–	–	0.720	–	–
		NOZZLE GEOMETRY	–	–	N_3 N_5	–	–
	FINS	NUMBER	NONE	NONE	NONE	NONE	NONE
		THICKNESS RATIO	–	–	–	–	–
		SWEEPBACK ANGLE	–	–	–	–	–
		TRAILING EDGE POS.	–	–	–	–	–
	BASE	DIAMETER RATIO	–	1.[illegible] - [illegible]	1.25 - 1.5	–	–
		AREA RATIO	–	1.[illegible] - [illegible]	2 - 2.2	–	–
BOUNDARY LAYER PARAMETERS		CHARACTER	–	T_E	T	–	T
		R_d x 10^{-6}		0.29 - 7.63	1.78 - 1.92	–	7.2 - 21.3
		R_L x 10^{-6}	1.2 - 2.6	2.5 - 6.4	–	–	36 - 149.3
TYPE OF INVESTIGATION		THEORETICAL	NO	NO	NO	NO	NO
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	M_1	M_2	M_2 M_1	–	M_1 M_3
		BOATTAIL PRESS DISTR.	S P T	NO	S P T	S P T	NO
		FORCE	NO	YES	YES	NO	NO
RESULTS		OUTPUT FORMAT	G	G	G	G	G
	LIMITS	M	T C	T C	T C	T C	0.5 - 4.0
		R_d	T C	0.29 - 3.63 x 10^6	T C	T C	T C
		α	0	0	T C	0	-6° - 12°
		OTHER	–	–	CLEAN AFTER-BODIES	–	–
PRINCIPAL APPLICATION		AIRCRAFT			•	•	•
		MISSILES	•	•	•		•
		PROJECTILES	•	•	•	•	•
		NACELLES			•		

			REPORTS SURVEYED				
			71	72	73	74	75
TEST CONDITIONS		MACH NUMBER RANGE	0 - 4	0.2 - 0.8	0.6 - 2.7	0.7 - 1.3	0.25 - 0.7
		REYNOLDS NO/FT x 10^6	2.65 - 5.01	1.5 - 5.4	0.6 - 10	-	3.3 - 15
		α RANGE	-12° - 18°	-10° - 20°	0° - 10°	0°	0°
CONFIGURATION	AFTERBODY	FOREBODY	N_1	N_2	B_1	N_1 B_2	N_2 N_3 B_1
		CONTOUR	A_1 A_4 A_7	A_2	A_1 A_2	A_7	A_1 A_2 A_3
		FINENESS RATIO	1.0	2.06	1	2.4 - 2.6	
		MAXIMUM DIAMETER	2.25, 4.25	7 in	-	7" x 4.6"	2 in
		MAX. BOATTAIL ANGLE	7°	16.9°	24°	10°, 15°, 20°	16°
	JET	NUMBER	NONE	1	2	1 and 2	NONE
		TEMPERATURE	-	COLD	-	COLD	-
		PRESSURE RATIO	-	1 - 1.15	-	1.0 - 7.0	-
		DIAMETER RATIO	-	-	-	0.26 - 0.36	-
		NOZZLE GEOMETRY	-	-	N_3 N_5	N_3	-
	FINS	NUMBER	NONE	3 4	2	NONE	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	20.083°	-	-	-
		TRAILING EDGE POS.	-	-	-	-	-
	BASE	DIAMETER RATIO	0.75 - 1.0	0.3143 - 0.6029	-	-	0.5 - 1.0
		AREA RATIO	0.56 - 1.0	0.099 - 0.363	-	0.041 - 0.096	0.25 - 1.0
BOUNDARY LAYER PARAMETERS		CHARACTER	-	-	-	T	-
		R_d x 10^6	0.94	0.9 - 3.1	-	-	0.55 - 2.5
		R_L x 10^{-6}	3.7 - 6.6	9 - 32	-	-	-
TYPE OF INVESTIGATION		THEORETICAL	NO	NO	NO	NO	NO
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	M_1 M_3	M_1 M_2	M_1 M_2	M_2	M_1
		BOATTAIL PRESS. DISTR.	NO	S P T	NO	YES	S P T
		FORCE	NO	YES	NO	YES	NO
RESULTS		OUTPUT FORMAT	G	G	G, T	G	TE, G
	LIMITS	M	T C	T C	T C	T C	T C
		R_d	T C	T C	T C	-	T C
		α	-10° - 15°	-10° - 20°	0° - 10°	0°	0°
		OTHER	-	-	-	-	
PRINCIPAL APPLICATION		AIRCRAFT	'		'	'	'
		MISSILES	'	'			'
		PROJECTILES	'	'			'
		NACELLES					'

			REPORTS SURVEYED				
			76	77	78	79	80
TEST CONDITIONS		MACH NUMBER RANGE	0 - 3	0.1 - 3.5	2.0	0.5 - 0.9	2.73 - 4.98
		REYNOLDS NO/FT x 10^{-6}	0 - 3	-	3.78	2.5, 1.2 - 1.7	2.28 - 10.56
		α RANGE	0	0	0	0	0
CONFIGURATION	AFTERBODY	FOREBODY	N_1 B_3 W	-	B_1	N_2 B_1, B_1	N_1 B_1 N_2
		CONTOUR	A_5	A_4 A_6	A_1 A_4 A_5	A_4	A_5 A_4
		FINENESS RATIO	-	-	0 - 3.1	4, 3	0
		MAXIMUM DIAMETER	5.4 - 12 in	-	3.9 in	2, 1.4	1.5 in
		MAX. BOATTAIL ANGLE	5°	10.79°	14.5°	0	-
	JET	NUMBER	1	1	1	2, 1	NONE
		TEMPERATURE	ROCKET	HOT	1500°C	85°F	-
		PRESSURE RATIO	-	-	2.0	1 - 8	-
		DIAMETER RATIO	0.35 - 0.44	-	0.579	0.38	-
		NOZZLE GEOMETRY	N_4	-	N_7	N_1 N_7 N_7	-
	FINS	NUMBER	2, 3, 4	YES	NONE	2 W, 0	NONE
		THICKNESS RATIO	0.10	-	-	0.08	-
		SWEEPBACK ANGLE	45 - 60°	-	-	0	-
		TRAILING EDGE POS.	FLUSH, FWD	-	-	24 FWD	-
	BASE	DIAMETER RATIO	1.00 - 0.50	-	0.579	1.0	1.0
		AREA RATIO	0.293 - 0.738	-	0.335	0.78, 0.86	1.0
BOUNDARY LAYER PARAMETERS		CHARACTER	T	L, T	T	T	L T
		R_d x 10^{-6}	0 - 3	-	14.7	0.2 - 0.42	0.19 - 0.88
		R_L x 10^{-6}	0 - 35	-	-	0.6 - 1.6	0.6 - 8.8
TYPE OF INVESTIGATION		THEORETICAL	NO	YES	YES	NO	NO
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	?	M_3	M_5	M_6 M_5	M_1
		BOATTAIL PRESS DISTR	S P T	-	S P T	NO	BASE PR.
		FORCE	NONE	-	NO	YES	NO
RESULTS		OUTPUT FORMAT	G	G, D	G, TI	G, EC	G
	LIMITS	M	T C	T C	T C	0.5 - 0.9	T C
		R_d	T C	T C	T C	0.2 - 0.4	T C
		α	0	0	0	0	0
		OTHER	-	-	-	BASE DRAG	-
PRINCIPAL APPLICATION		AIRCRAFT	•		•	•	
		MISSILES	•	•	•	•	•
		PROJECTILES					•
		NACELLES	•		•		

			REPORTS SURVEYED				
			81	82	83	84	85
TEST CONDITIONS		MACH NUMBER RANGE	0.4 - 1.3	0.4 - 1.3	0.6 - 0.9	0.6 - 0.9	0.6 - 0.9
		REYNOLDS NO/FT x 10^6	2.4 - 4.4	3 - 4.3	4 - 99	-	-
		α RANGE	-4° - 8°	0°	0°	0°	0°
CONFIGURATION	AFTERBODY	FOREBODY	N_3	N_3 N_2	N_3 B_1	N_3 B_3 W	N_3 B_3
		CONTOUR	A_2	A_2	A_2 A_5	A_2 A_2+A_1 A_5	A_2 A_2+A_1 A_5
		FINENESS RATIO	1.0 - 2.0	0.8 - 1.77	0.8, 0.96 1.77	0.8 - 1.77	0.8 - 1.77
		MAXIMUM DIAMETER	15.24 cm	15.24 cm	1 in	1 in	1 in
		MAX. BOATTAIL ANGLE	22.07°	34.037°	25°	-	-
	JET	NUMBER	1	1	1	NONE	1
		TEMPERATURE			-	-	-
		PRESSURE RATIO	1 - 6	1 - 16	SIMUL	-	SIMUL.
		DIAMETER RATIO	0.6 - 0.7	0.50	0.5, 0.544	-	0.5 - 0.55
		NOZZLE GEOMETRY	N_2 N_7	N_3	-	-	-
	FINS	NUMBER	NONE	NONE	NONE	NONE	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-	-
		TRAILING EDGE POS.	-	-	-	-	-
	BASE	DIAMETER RATIO	0.61 - 0.71	0.51	0.5, 0.544	0.5 - 0.544	0.5 - 0.544
		AREA RATIO	0.36 - 0.49	0.25	0	0	0
BOUNDARY LAYER PARAMETERS		CHARACTER	T	T	T	T	T
		R_d x 10^6	1.2 - 2.18	1.5 - 2.14	0.3 - 8.2	-	-
		R_L x 10^6	9.6 - 17.5	12 - 17	2.5 - 132	2.5 - 67	2.5 - 130
TYPE OF INVESTIGATION		THEORETICAL	NO	NO	NO	NO	YES
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	M_1 M_2	M_1 M_2	M_1	M_1	M_1
		BOATTAIL PRESS. DISTR.	S P T	S P T	S P T	S P T	S P T
		FORCE	YES	YES	YES	NO	NO
RESULTS		OUTPUT FORMAT	G	G	G	G	G
	LIMITS	M	T C	T C	0.6 - 0.9	T C	T C
		R_d	T C	T C	0.3 - 8.2	T C	T C
		α	T C	0°	0°	0°	0°
		OTHER	-	-	-	-	-
PRINCIPAL APPLICATION		AIRCRAFT			✓	✓	✓
		MISSILES	✓	✓	✓	✓	✓
		PROJECTILES	✓	✓			
		NACELLES		✓	✓	✓	✓

			REPORTS SURVEYED				
			86	87	88	89	90
TEST CONDITIONS		MACH NUMBER RANGE	0.4 - 1.3	0.6 - 2.5	0.7 - 2.2	0.6 - 1.5	0.6 - 1.5
		REYNOLDS NO./FT x 10^{-6}	2.28 - 4.25	2.1, 2.5	–	1 - 4	1.0 - 3.0
		α RANGE	0°	-5° - 25°	0°	0°	0°
CONFIGURATION	AFTERBODY	FOREBODY	N_1 B_2	N_2	B_1	N_3 B_1	N_3 B_1
		CONTOUR	A_2	A_1	A_4	A_2	A_5
		FINENESS RATIO	0.8 - 2.0	1.3	0	2	1.83
		MAXIMUM DIAMETER	6 in	9.86 in	11.3 in	9.86 in	9.69 in
		MAX. BOATTAIL ANGLE	34°	10°	1.5°	-	25°
	JET	NUMBER	1	1	1	1	1
		TEMPERATURE	-	-	COLD	70° - 2140°F	530 - 2500°F
		PRESSURE RATIO	1 - 6	-	3 - 20	2 - 12.7	6 - 12
		DIAMETER RATIO	0.5 - 0.7		1.0	-	0.44
		NOZZLE GEOMETRY	-	N_4	N_4	N_3	N_4
	FINS	NUMBER	NONE	NONE	NONE	NONE	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-	-
		TRAILING EDGE POS.	-	-	-	-	-
	BASE	DIAMETER RATIO	0.51 - 0.71	0.7	-	-	0.51
		AREA RATIO	0.01 - 0.014	0.5	2.05 - 2.79	0.049	0.016
BOUNDARY LAYER PARAMETERS		CHARACTER	T	T	T	–	T
		R_{δ} x 10^{-6}	-	1.72 - 2.05	–	0.49 - 1.23	0.81 - 2.4
		R_L x 10^{-6}	1.5 - 2.14	24.0 - 28.9	–	7.66 - 19.15	13 - 38
TYPE OF INVESTIGATION		THEORETICAL	NO	NO	NO	YES	NO
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	M_2	M_2	M_5	M_2	M_2
		BOATTAIL PRESS. DISTR.	S P T	S P T	S P T	S P T	S P T
		FORCE	NO	YES	NO	YES	YES
RESULTS		OUTPUT FORMAT	G	G	G	G, T	G
	LIMITS	M	T C	T C	T C	0.6 - 1.5	0.6 - 1.5
		R_{δ}	T C	T C	T C	T C	0.8 - 2.4
		α	0°	-5° - 25°	0°	0°	0°
		OTHER	-	-	-	-	-
PRINCIPAL APPLICATION		AIRCRAFT	✓	✓	✓	✓	✓
		MISSILES	✓	✓	✓	✓	✓
		PROJECTILES		✓	✓	✓	
		NACELLES	✓	✓	✓	✓	✓

			REPORTS SURVEYED				
			91	92	93	94	95
TEST CONDITIONS		MACH NUMBER RANGE	0.7 - 0.86	0.4 - 2.5	2.09 - 4.37	0.5 - 1.2	0.9 - 1.2
		REYNOLDS NO./FT x 10^{-6}	-	2.6 - 13.5	12.9 - 17.2	2.4	2.07 - 2.22
		α RANGE	0° - 6°	0°	0°	0°	±2°
CONFIGURATION	AFTERBODY	FOREBODY	B_1	N_1 B_1	B_1	B_1	N_1 B_1
		CONTOUR	-	A_4	A_1 A_2	A_4	A_4 A_1 A_8
		FINENESS RATIO	-	0	0.22	0	0 - 1.5
		MAXIMUM DIAMETER	-	75 mm	3.36 in	2.75 in	2.5 in
		MAX. BOATTAIL ANGLE	-	0°	15.7°	0°	9.467°
	JET	NUMBER	1	NONE	NONE	1	NONE
		TEMPERATURE		-	-	COLD	-
		PRESSURE RATIO	1.2 - 3.6	-	-	1.0 - 3.5	-
		DIAMETER RATIO	-	-	-	0.65	-
		NOZZLE GEOMETRY	-	-	-	N_4	-
	FINS	NUMBER	NONE	NONE	NONE	NONE	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-	-
		TRAILING EDGE POS.	-	-	-	-	-
	BASE	DIAMETER RATIO	-	1.0	0.917	1.0	0.727 - 1.17
		AREA RATIO	-	0.64 - 1.0	0.84	0.577	0.528 - 1.373
BOUNDARY LAYER PARAMETERS		CHARACTER	-		T	T	-
		R_d x 10^{-6}	-	0.35 - 2.1	-	0.55	-
		R_L x 10^{-6}	-	3 - 20	-	-	-
TYPE OF INVESTIGATION		THEORETICAL	NO	NO	NO	YES	NO
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	M_2 M_3	M_1 M_2	-	M_5	M_1 M_2
		BOATTAIL PRESS. DISTR.	NO	S P T	S P T	S P T	S P T
		FORCE	NO	NO	NO	NO	NO
RESULTS		OUTPUT FORMAT	G	G	G, T	TE, G	G
	LIMITS	M	0.7 - 0.86	T C	T C	T C	T C
		R_d	T C	T C	T C	T C	T C
		α	0 - 6°	0°	0°	0°	T C
		OTHER	-	-	-	-	-
PRINCIPAL APPLICATION		AIRCRAFT	•	•	•	•	•
		MISSILES		•	•	•	•
		PROJECTILES		•	•		•
		NACELLES	•	•	•	•	•

			REPORTS SURVEYED				
			96	97	98	99	100
TEST CONDITIONS		MACH NUMBER RANGE	2.0 - 3.5	2.5, 3.0	0.6 - 2.2	0.6 - 0.9	0.18
		REYNOLDS NO/FT x 10^{-6}	6.0	5.52 - 6.12	-	3.68 - 4.62	1.24
		α RANGE	0	0	0	0	-10° - 10°
CONFIGURATION	AFTERBODY	FOREBODY	N_1 B_1	N_1 B_1	B_2	B_1	N_2 B_1
		CONTOUR	A_1 A_5 A_6	A_4	A_6	A_1	A_2
		FINENESS RATIO	0.818 - 1.2	0	-	0 - 3.0	10, 12
		MAXIMUM DIAMETER	2.5 in	2.5 in	-	2 in	6 in
		MAX. BOATTAIL ANGLE	17°	0°	5°	11°	-
	JET	NUMBER	1	1	2	1	NONE
		TEMPERATURE	COLD	COLD	-	COLD	-
		PRESSURE RATIO	1 - 20	5 - 165	-	1.0 - 7.5	-
		DIAMETER RATIO	0.2	0.2	-	0.375	-
		NOZZLE GEOMETRY	N_4	N_4	N_3 N_4	N_3	-
	FINS	NUMBER	NONE	RING	3	NONE	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	0°	-	-	-
		TRAILING EDGE POS.	-	ALL	-	-	-
	BASE	DIAMETER RATIO	0.5 - 0.818	1.0	-	0.418 - 1.0	0 - 1.0
		AREA RATIO	0.49	0.96	-	0 - 0.85	0 - 1.0
BOUNDARY LAYER PARAMETERS		CHARACTER	"	-	-	-	T
		R_d x 10^{-6}	12.5	1.15 - 1.27	-	0.61 - 0.77	0.618
		R_L x 10^{-6}	90	6.9 - 7.65	-	2	7.42
TYPE OF INVESTIGATION		THEORETICAL	NO	NO	NO	NO	YES
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	M_2	M_2	M_3	M_6	M_2
		BOATTAIL PRESS DISTR.	S P T	S P T	S P T	S P T	S P T
		FORCE	NO	NO	NO	NO	NO
RESULTS		OUTPUT FORMAT	G	G	G	G	G, T
	LIMITS	M	T C	T C	T C	T C	0.18
		R_d	T C	T C	T C	T C	T C
		α	0	0	0	0	-10° - 10°
		OTHER	-	-	-	-	-
PRINCIPAL APPLICATION		AIRCRAFT			•	•	•
		MISSILES	•	•		•	•
		PROJECTILES		•		•	•
		NACELLES				•	

			REPORTS SURVEYED				
			101	102	103	104	105
TEST CONDITIONS		MACH NUMBER RANGE	0 - 8.0	1.96	0.56 - 1.0	0.6 - 1.3	3.92
		REYNOLDS NO/FT x 10^{-6}	-	-	3.6 - 4.6	3.3 - 4.4	1.65 - 38.5
		α RANGE	0°	0°	0° - 8°	0°	0°
CONFIGURATION	AFTERBODY	FOREBODY	N_3 B_1	SQUARE CYLINDER	N_3 B_1	-	B_1
		CONTOUR	A_1 A_6	SQUARE CYLINDER	A_2 A_4 A_6	A_1 A_2	A_4
		FINENESS RATIO	1	0	0.2 - .25	0 - 3.56	0
		MAXIMUM DIAMETER		1.35 in	4 in	1 in	1.4 in
		MAX. BOATTAIL ANGLE	12°	0°	15°	45°	0°
	JET	NUMBER	1	1	1	NONE	1
		TEMPERATURE	-	COLD	-	-	COLD
		PRESSURE RATIO	-	16.0	-	-	LOW
		DIAMETER RATIO	-	0.625 - 0.708	0.405	-	?
		NOZZLE GEOMETRY	-	N_4	-	-	POROUS
	FINS	NUMBER	NONE	NONE	NONE	NONE	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-	-
		TRAILING EDGE POS.	-	-	-	-	-
	BASE	DIAMETER RATIO	0 - 1.0	0.847 - 1.0	0 - 0.67	0 - 0.85	1.0
		AREA RATIO	0 - 1.0	0.218 - 0.641	0 - 0.45	0 - 0.72	1.0
BOUNDARY LAYER PARAMETERS		CHARACTER	-	-	T	T	L/T
		R_d x 10^{-6}	-	-	-	-	0.192 - 4.49
		R_L x 10^{-6}	2 - 22	-	-	-	-
TYPE OF INVESTIGATION		THEORETICAL	YES	NO	YES	NO	YES
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	M_7	ON WALL	M_2	M_5	M_5
		BOATTAIL PRESS. DISTR.	NO	S P T	S P T	S P T	NO
		FORCE	NO	NO	YES	NO	NO
RESULTS		OUTPUT FORMAT	G	G	G	G	G, TE
	LIMITS	M	T C	T C	T C	T C	T C
		R_d	T C	T C	T C	T C	T C
		α	0°	0°	0° - 8°	0°	0°
		OTHER		-	-	-	-
PRINCIPAL APPLICATION		AIRCRAFT	✓			✓	
		MISSILES	✓		✓	✓	✓
		PROJECTILES	✓		✓	✓	✓
		NACELLES	✓	✓		✓	

			REPORTS SURVEYED				
			106	107	108	109	110
TEST CONDITIONS		MACH NUMBER RANGE	1.5, 2.0	1.5 - 2.41	1.9 - 2.0	0.8 - 1.1	0.77 - 1.20
		REYNOLDS NO/FT x 10^{-6}	4.8 - 51	-	-	4	8 - 10
		α RANGE	0	0	0	0	0
CONFIGURATION	AFTERBODY	FOREBODY	N_1 B_1	-	B_1	N_1 B_3	-
		CONTOUR	A_4	A_1 A_2 PARAB	A_4	A_1 A_4	A_1 A_4
		FINENESS RATIO	0	-	0	0.5 - 1.0	0.5 - 1.0
		MAXIMUM DIAMETER	1.25 in	-	0.810 in	2 in	2 in
		MAX. BOATTAIL ANGLE	0°	24.5°	PLUG 10°	9°	9°
	JET	NUMBER	NONE	1	1	1	1
		TEMPERATURE	-	-	HOT	ROOM TEMP.	ROOM TEMP.
		PRESSURE RATIO	-	2 - 20	1.2 - 10	-	-
		DIAMETER RATIO	-	-	1.136 in	0.40	0.40
		NOZZLE GEOMETRY	-	N_3 N_4	INT.-EXT. EXP. PLUG	N_1	N_1
	FINS	NUMBER	4	NONE	NONE	NONE	NONE
		THICKNESS RATIO	0.05 - 0.1	-	-	-	-
		SWEEPBACK ANGLE	0	-	-	-	-
		TRAILING EDGE POS.	FLUSH	-	-	-	-
	BASE	DIAMETER RATIO	1.0	0.55 - 0.83	0.274	0.685 - 0.95	0.69 - 0.95
		AREA RATIO	1.0	-	0.0754	0.31 - 0.74	0.31 - 0.74
BOUNDARY LAYER PARAMETERS		CHARACTER	T	-	-	T	-
		R_d x 10^{-6}	0.5 - 4.5			0.67	1.3 - 1.7
		R_L x 10^{-6}	0.3 - 32.8	-	-	56	-
TYPE OF INVESTIGATION		THEORETICAL	YES	NO	YES	NO	NO
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	M_1 M_3	-	M_5 -	M_2	-
		BOATTAIL PRESS. DISTR.	S P T	S P T	S P T	S P T	S P T
		FORCE	NO	NO	NO	NONE	NONE
RESULTS		OUTPUT FORMAT	G, TE	EC, G	G, TE	EC, G	G
	LIMITS	M	T C	T C	T C	T C	T C
		R_d	T C	T C	T C	T C	T C
		α	0	0	0	0	0
		OTHER	-	-	-	LOW THRUST	LOW THRUST
PRINCIPAL APPLICATION		AIRCRAFT		✓	✓		
		MISSILES	✓	✓	✓		
		PROJECTILES				✓	✓
		NACELLES		✓	✓		

			REPORTS SURVEYED				
			111	112	113	114	115
TEST CONDITIONS		MACH NUMBER RANGE	0.6 - 1.3	3.88	2.01 - 3.27	2.5 - 3.5	2.5 - 3.5
		REYNOLDS NO./FT x 10^{-6}	4.14	15.6	-	6.0	6.0
		α RANGE	0 - 16.4°	0°	-	0°	0°
CONFIGURATION	AFTERBODY	FOREBODY	N_1 B_1	B_1	B_1	N_1	N_1 B_1
		CONTOUR	A_1	A_4	A_1 A_4	A_1 A_2 A_8	A_4
		FINENESS RATIO	2.3	-	-	-	1
		MAXIMUM DIAMETER	-	-	-	2.5 in	2.5 in
		MAX. BOATTAIL ANGLE	8°	0°	20°	15°	0°
	JET	NUMBER	NONE	1	1	1	1
		TEMPERATURE	-	COLD (60°F)	-	COLD	-
		PRESSURE RATIO	-	LOW	-	1 - 420	-
		DIAMETER RATIO	-	0.88 - 0.17	-	0.2	0.2
		NOZZLE GEOMETRY	-	N_3 & POROUS	N_4	N_4	N_4
	FINS	NUMBER	2 (WINGS)	NONE	NONE	NONE	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-	-
		TRAILING EDGE POS.	FORWARD	-	-	-	-
	BASE	DIAMETER RATIO	0.9	1.0	-	0.5 - 0.7	1.0
		AREA RATIO	0.8	1.0	-	0.25 - 0.49	0.96
BOUNDARY LAYER PARAMETERS		CHARACTER	T	T	-	T	T
		R_d x 10^{-6}	2.35	15.6	-	-	1.25
		R_L x 10^{-6}	4.4	-	-	-	7.5
TYPE OF INVESTIGATION		THEORETICAL	YES	NO	YES	NO	NO
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	M_1	M_5	-	M_2	M_2
		BOATTAIL PRESS. DISTR.	NO	NO	NO	S P T	NO
		FORCE	YES	NO	NO	NO	NO
RESULTS		OUTPUT FORMAT	G	G, EC	G	G	G
	LIMITS	M	1.0 - 1.4	T C	2.01 - 3.27	T C	2.5 - 3.5
		R_d	T C	15.6 x 10^{-6}	T C	T C	1.25
		α	0 - 16.4°	0°	-	0°	0°
		OTHER	-	W/ BLEED	-	-	-
PRINCIPAL APPLICATION		AIRCRAFT			•		
		MISSILES	•	•	•	•	•
		PROJECTILES	•	•	•	•	•
		NACELLES			•	•	

			REPORTS SURVEYED				
			116	117	118	119	
TEST CONDITIONS		MACH NUMBER RANGE	3.0 - 4.0	0.6 - 0.9	3.92	SUPERSONIC	
		REYNOLDS NO/FT x 10^{-6}	1.2 - 12	0.2 - 1.06	38.5	-	
		α RANGE	0°	0° - 16°	0°	0°	
CONFIGURATION	AFTERBODY	FOREBODY	N_1 B_1	B_3	B_1	-	
		CONTOUR	A_1	A_1 A_2 A_7	A_4	-	
		FINENESS RATIO	1.0	-	0	-	
		MAXIMUM DIAMETER	1.0 in	63.5 cm	1.4 in	-	
		MAX. BOATTAIL ANGLE	[illegible]	31°	0°	-	
	JET	NUMBER	NONE	1	1	NONE	
		TEMPERATURE	-	-	COLD	-	
		PRESSURE RATIO	-	1.5 - 4.5	LOW	-	
		DIAMETER RATIO	-	0.86	-	-	
		NOZZLE GEOMETRY	-	N_7	HOLE AND PORTS	-	
	FINS	NUMBER	0, 4		[illegible]	[illegible]	
		THICKNESS RATIO	0.062	-	-	-	
		SWEEPBACK ANGLE	0°		-	-	
		TRAILING EDGE POS.	FLUSH	FORWARD	-	-	
	BASE	DIAMETER RATIO	0.65	0.86	-	-	
		AREA RATIO	0.42	-	0.017 - 0.093	-	
BOUNDARY LAYER PARAMETERS		CHARACTER	L/T	T	-	-	
		R_δ x 10^{-6}	0.1 - 1.0	0.43 - 2.2		-	
		R_L x 10^{-6}	1 - 7	4.9 - 25.4	-	-	
TYPE OF INVESTIGATION		THEORETICAL	NO	NO	NO	[illegible]	
		EXPERIMENTAL	YES	YES	YES	YES	
MEASUREMENTS		MOUNTING TECHNIQUE	M_1	M_1 M_3	M_5	-	
		BOATTAIL PRESS DISTR.	NO	S P T	S P T	-	
		FORCE	NO	NO	NO	-	
RESULTS		OUTPUT FORMAT	G	G	G	G	
	LIMITS	M	3.0 - 4.0	T C	T C	SUPERSONIC	
		R_δ	T C	T C	T C	T C	
		α	0°	0° - 16°	0°	0°	
		OTHER	-	-	-	-	
PRINCIPAL APPLICATION		AIRCRAFT		•			
		MISSILES	•	•	•	•	
		PROJECTILES	•		•	•	
		NACELLES		•			

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